

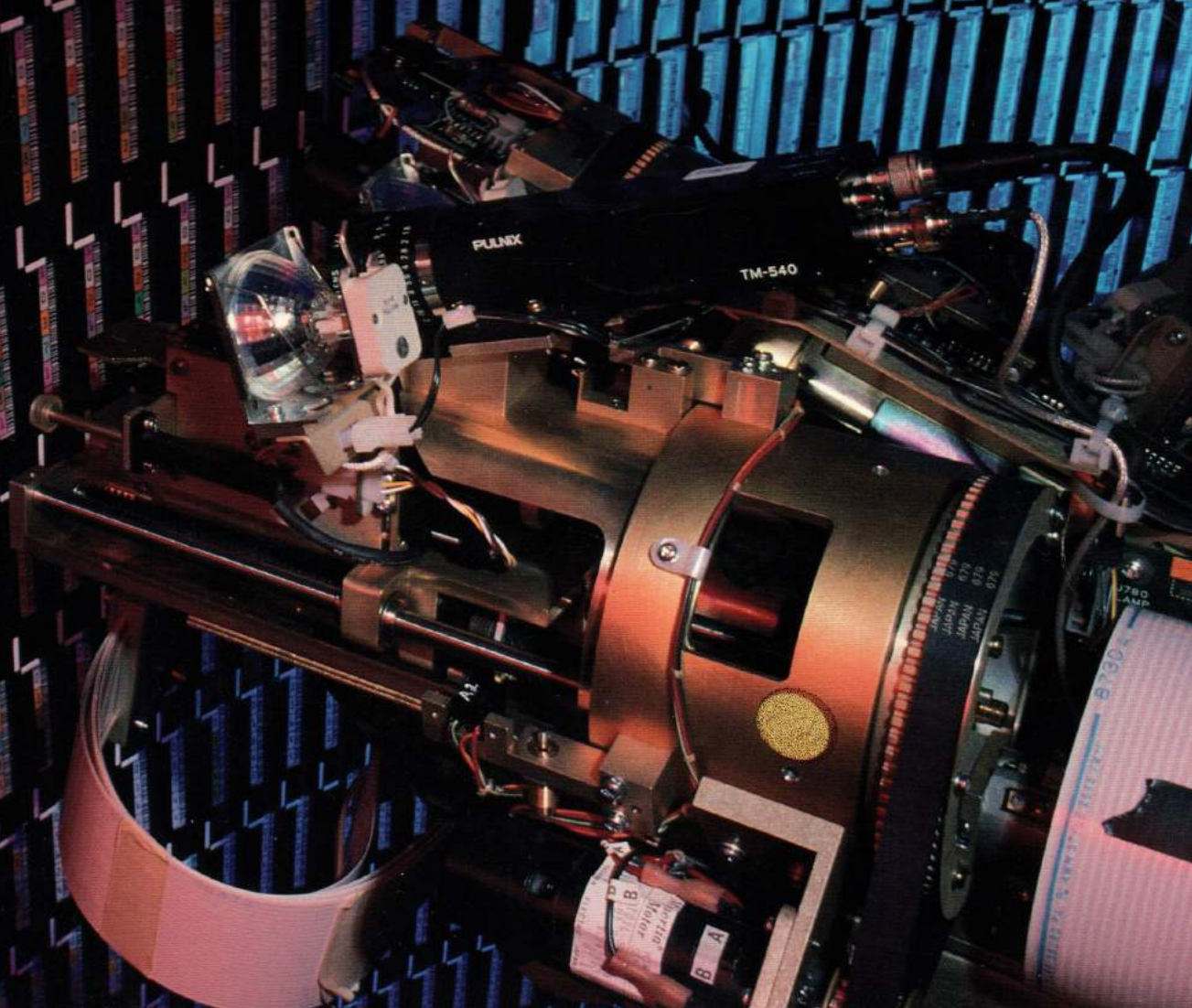
Edata

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StorageTek

NEARLINE

Information technology that creates
new information strategies.



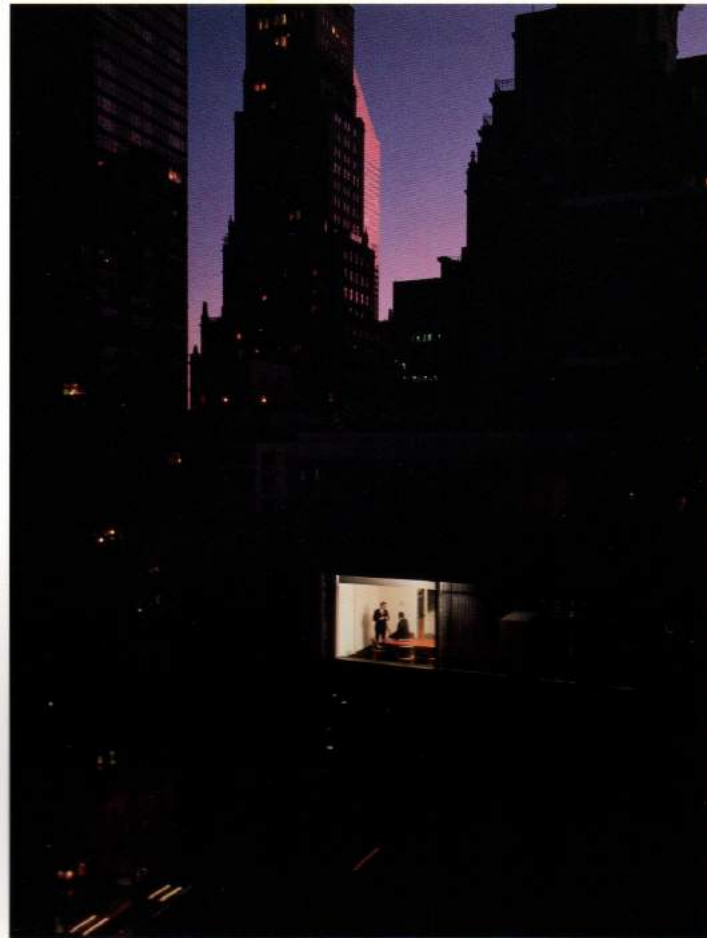
The business challenge

In today's increasingly competitive business environment, information systems have become a critical asset in the twofold challenge facing the business enterprise: compete effectively and increase profitability.

In the early 1980s, we began to move from the age of data to the age of information. The amount of information needed to support the business entity has grown exponentially, and the challenge of managing that information has become more crucial. Today's users of the data center are growing in number, their requests for information more frequent and more demanding. As interrupted access to data can result in lost revenue to the corporation, service-level agreements become more common. And executives are continually looking to information systems to provide new avenues for making their company more competitive.

Increasingly, the data center is forced to assume the role of a profit center. At the same time, the highest level of customer service must be provided at the lowest possible cost.

Staffing a data center is becoming more challenging. The demand for labor over the next decade is expected to outstrip the available workforce. Data centers must run around the clock, but it is increasingly difficult to find needed staff to work offshift. This scenario, coupled with the inefficiencies that employee turnover produces and the employee's growing need for more rewarding work, makes the management of human resources more critical.



The two traditional methods of storage — online and offline — no longer are adequate to meet the expanding challenges facing the data center director.

Online access devices can provide an instantaneous initial service time for data. The data center, and ultimately the user, however, must pay a very high price for this type of information storage, often for information that may not really belong online.

Offline access devices have a substantially lower cost per megabyte stored. The media is removable and can be transported easily from one data center to another. The nature of offline storage, however, results in very slow and inconsistent initial service times, unacceptable for most applications. Manual offline storage is very labor-intensive, resulting in other high costs of storing and accessing the information.

"In order for Qantas Airways to maintain its competitive advantage, we must provide our clients within Qantas quick, reliable access to information. The 4400 ACS allows us to do just that—cost-effectively."



Ian Riddell
General Manager
QANTEK (Information
Technology Subsidiary of
Australia's Qantas Airways)



"There are dollar justifications for the library but the real benefits for us are the consistency of mounts and our ability to use system managed storage."

Larry Duntz
Assistant Manager,
Computer Services
BEECH AIRCRAFT
(U.S. aircraft manufacturer)

Nearline and Storage Technology

When Storage Technology Corp. introduced the 4400 Automated Cartridge System (ACS) in 1987, we were breaking new ground. We concentrated on educating potential users



of the ACS, and identifying the high-technology pioneers in our target market, as any new-product introduction in our industry would do.

Now, our 4400 ACS customers are telling us about the benefits of our revolutionary nearline system. Customers worldwide, in diverse industries including financial services, manufacturing, insurance, communications and government agencies, have installed the 4400 ACS. They are reaping a variety of benefits both within their data centers and throughout their corporations.

Increased profitability

As the need for and the quantity of information has grown, the number of expensive computer assets such as online disk storage devices has increased tremendously. 4400 ACS customers have recognized that nearline can help them manage the cost of this expensive resource. Sequential files on disk that require quick but not instantaneous initial access times can be migrated to the 4400 ACS. The 4400 ACS also is an ideal archival and retrieval medium for information managed by storage management products such as HSM, a portion of the IBM DF/SMS™, or the Sterling Software DMS/OS™. A large retail customer avoided over \$1 million in DASD expenditures in the first year of operation by implementing the 4400 ACS in conjunction with storage management and migration of files to nearline. With nearline, migration of data sets from high-speed storage to automated cartridge can be a reality.

New applications, not previously justifiable, now can be justified with nearline. Many customers are implementing software packages which allow output reports to be viewed in electronic form via terminals, reducing both the abundant and growing amounts of paper and the resources required to control its distribution.

With report output growing at a compounded annual rate of 50 percent to 60 percent, a reduction of even 10 percent to 20 percent can have a significant payback to the corporation. Nearline affords a high-capacity, cost-effective solution to the problem of storing this report data, providing much more flexibility than is possible with the use of online storage only. Our communications customers save in printing and distribution costs, at the same time providing a history of reports easily accessible anytime by the user. The result: more informed decision-making with reduced cost.

Floor-space costs, particularly in large metropolitan areas, and power costs, continue to rise. Nearline is a fraction of the purchase price of online, and is also less expensive in terms of environmental. For example, the 4400 ACS allows our customers to store about 10 gigabytes of data in one square foot of computer room space, approximately 12 times the amount possible with K-class DASD.

As corporate profits are squeezed in today's increasingly competitive environment, it is essential to control operating expenses. Nearline provides the vehicle to manage growth and stabilize budgets.

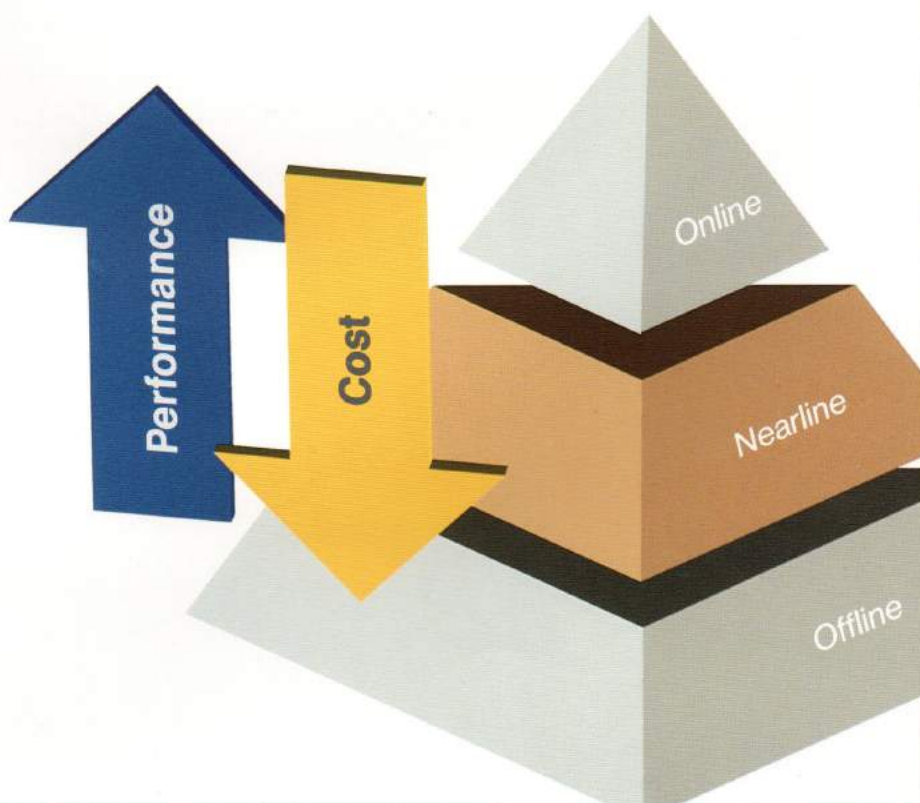
One data center resource that continues its rapid growth is online storage. Historically, technology improvements have decreased the cost per megabyte; however, the overall complexity, cost and management of online storage have continued to rise.

Let's assume your online storage demand is increasing at a compound annual growth rate of 35 percent. If your data center has only 100 gigabytes of online storage today, you will be maintaining close to 500 gigabytes in just five years. And even with improvements in megabytes stored per square foot and decreases in the cost per megabyte, the floor space you will be required to allocate and the dollars you will spend will be significant.

Nearline provides a new choice not previously available to you. If nearline curbs the growth of your online storage by a conservative 5 percent per year, the savings to your organization relative to the expensive online asset could be millions of dollars.

"With the 4400s, we're able to store media more cheaply than DASD, access it more quickly than offline tape and still fit it into our budget."

Bryce Morrison
Director, Data Center Operations
MERVYN'S (U.S. retailer)





"The 4400 automated library was our choice because it allowed a maximum of cartridges in the minimum amount of floor space and it integrated perfectly into our data processing environment."

Gerard Lecomte
Director, Planning and
New Product Development
AEROSPATIALE AVIONS
TOULOUSE (French manu-
facturer of Airbus & ATR)

The Nearline concept

StorageTek, the company that has been providing innovative information storage and retrieval systems for two decades, offers you a proven method to address your information storage and management requirements. The nearline concept allows mass storage and automatic retrieval of information. It fills a critical void between the traditional choices of online and offline, solving both the performance and cost issues. Nearline provides a quick, consistent initial service time that is close to online in performance at only a small fraction of the cost of online storage.

This new dimension in storage management is provided by the StorageTek 4400 ACS. The 4400 ACS is a fully automated information storage system that mounts and demounts 18-track cartridges on the StorageTek cartridge subsystem, which is completely compatible with the IBM manual-only system. Additional software interfaces make the system available to non-IBM and mixed multivendor CPU environments as well.

The 4400 ACS consists of up to 16 interconnected library storage modules (LSM). Each LSM can store up to approximately 1,200 gigabytes; an entire system can store approximately 19.2 terabytes of data. Improving cartridge capacities will continue to increase the amount of data stored within the system. Within the LSM, advanced robotics technology, designed and manufactured by StorageTek, is combined with an optical scanning system. The robot "sees" the correct cartridge, verifies its volume serial number by "reading" the external barcode label, then mounts the cartridge into the attached 4480 drive. To accommodate current or future capacity requirements, up to 256 unique 4400 ACSs can be supported.





Nearline solutions

Corporations worldwide are realizing the benefits of nearline — a revolutionary concept in managing the increasing volumes of information needed to conduct their businesses. Key nearline solutions include:

- ▶ Manage growing requirements for cost-effective information storage
- ▶ Reduce costly errors and improve service levels within the corporation
- ▶ Use all data center resources efficiently — budgets, personnel, computer room assets
- ▶ Contribute to the corporation's success in remaining competitive

Summary

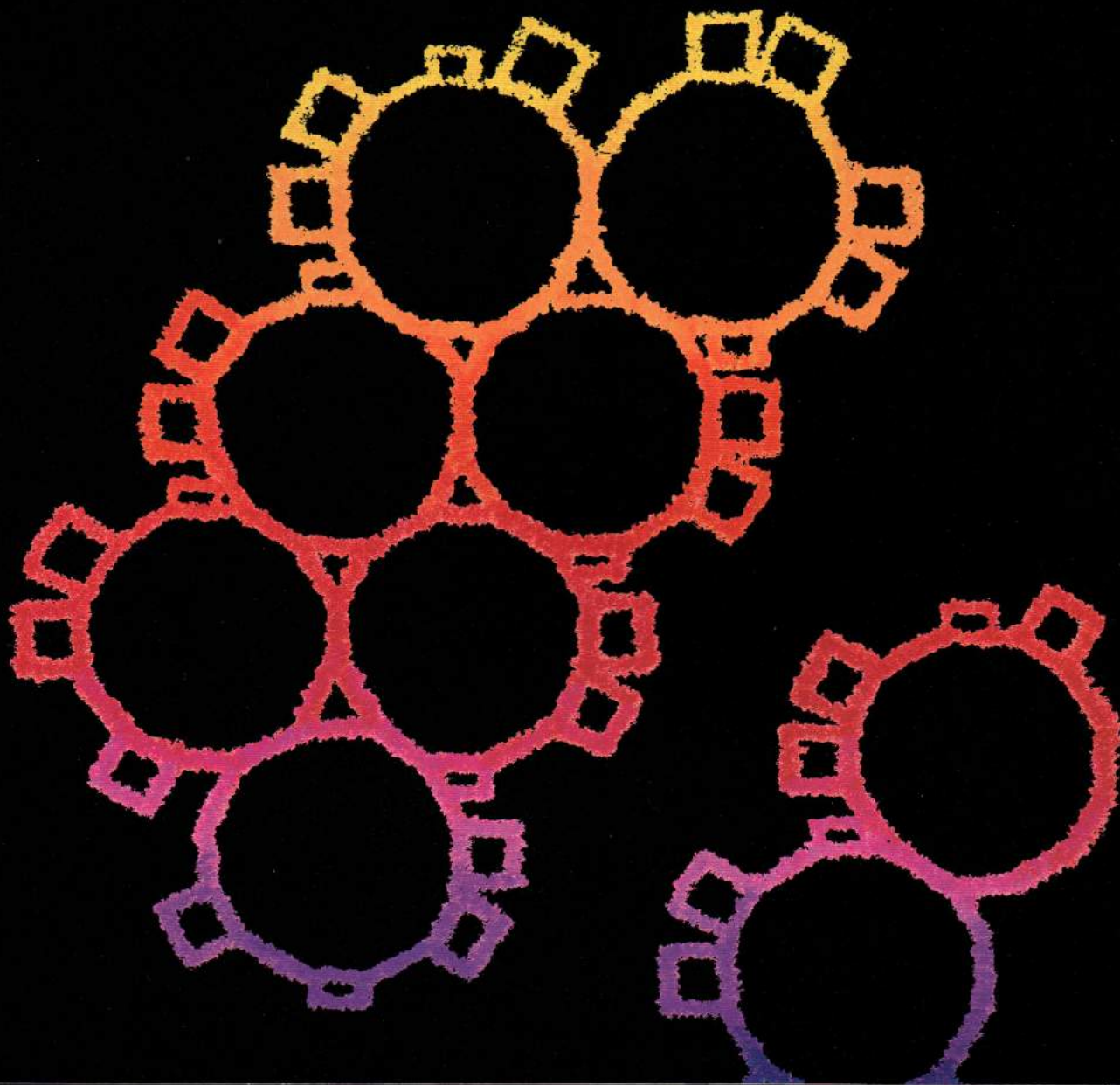
The requirements of the information age continue to place new challenges on managing the data center of tomorrow. Yesterday's products no longer are sufficient to meet these challenges. Innovative solutions are required to accommodate the unfolding information explosion.

StorageTek always has been a leader in providing innovative information storage and retrieval products. We have consistently gone beyond merely plug-compatible products to gain a reputation as a provider of value-added products to meet the growing needs of our customers. The tradition continues with nearline and the 4400 Automated Cartridge System.



Six LSMs installed at the Illinois Department of Central Management Services computer facility in Springfield support the largest state-run data processing center in the United States. The center assists 70 state government agencies servicing 11 million citizens.





StorageTek: The information storage and retrieval company.

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